Ephemeris for Physical Observations of the Moon for the Nine Lunations from April 12 to the end of 1888. By A. Marth.

Greenwich Noon.		Selenographical Colong. of the Sun.	Selenographical Lat. of the Sun.	Geocentric Libration. Long. of the Earth.	Geocentric Libration. Lat. of the Earth.	Geocentric Libration. Amount.	Geocentric Libration. Direction.
1888.		°	°	°	°	°	°
April	12	282·50	−1·48	−0·24	+6·54	6·54	2·1
	13	294·72	1·49	1·52	6·42	6·60	13·3
	14	306·95	1·50	2·81	6·02	6·64	24·9
	15	319·17	−1·50	−4·07	+5·36	6·73	37·1
	16	331·38	1·51	5·26	4·46	6·90	49·6
	17	343·59	1·52	6·33	3·35	7·15	62·0
	18	355·80	1·52	7·19	2·06	7·48	74·0
	19	8·00	1·53	7·77	+0·64	7·80	85·3
	20	20·20	1·53	7·99	−0·85	8·03	96·1
	21	32·39	1·54	7·76	2·35	8·11	106·9
	22	44·57	−1·54	−7·04	−3·75	7·98	118·2
	23	56·75	1·55	5·81	4·97	7·65	130·7
	24	68·93	1·55	4·12	5·90	7·19	145·2
	25	81·20	1·55	−2·09	6·43	6·76	162·1
	26	93·27	1·55	+0·12	6·51	6·51	181·1
	27	105·44	1·55	2·29	6·13	6·54	200·5
	28	117·61	1·54	4·23	5·31	6·79	218·4
	29	129·79	−1·54	+5·79	−4·16	7·13	234·2
	30	141·97	1·53	6·87	2·78	7·41	247·9
May	1	154·16	1·53	7·45	−1·28	7·56	260·2
	2	166·36	1·52	7·57	+0·25	7·57	271·9
	3	178·57	1·51	7·28	1·71	7·48	283·3
	4	190·78	1·51	6·66	3·05	7·32	294·7
	5	203·00	1·50	5·78	4·23	7·16	306·3
	6	215·22	−1·49	+4·73	+5·16	6·99	317·6
	7	227·45	1·49	3·56	5·91	6·90	329·1
	8	239·69	1·48	2·32	6·37	6·77	340·1
	9	251·92	1·47	+1·04	6·54	6·62	351·0
	10	264·16	1·46	−0·24	6·44	6·44	2·1
	11	276·40	1·46	1·51	6·05	6·24	14·0
	12	288·64	1·45	2·76	5·40	6·06	27·0
	13	300·88	−1·45	−3·94	+4·51	5·98	41·1
	14	313·12	1·44	5·04	3·34	6·04	56·4
	15	325·35	1·43	6·03	2·13	6·39	70·5

Greenwich Noon.		Selenographical Colong. of the Sun.	Selenographical Lat. of the Sun.	Geocentric Libration. Long. of the Earth.	Geocentric Libration. Lat. of the Earth.	Geocentric Libration. Amount.	Geocentric Libration. Direction.
1888.		°	°	°	°	°	°
May	16	337·58	1·42	6·82	+0·73	6·86	83·9
	17	349·80	1·42	7·37	−0·73	7·41	95·7
	18	2·02	1·41	7·61	2·19	7·91	106·1
	19	14·23	1·40	7·45	3·58	8·26	115·7
	20	26·44	−1·39	−6·86	−4·80	8·36	125·1
	21	38·64	1·38	5·80	5·77	8·18	135·0
	22	50·83	1·37	4·30	6·40	7·70	146·3
	23	63·02	1·36	2·46	6·61	7·05	159·7
	24	75·21	1·34	−0·40	6·36	6·37	176·4
	25	87·39	1·33	+1·69	5·66	5·90	196·5
	26	99·57	1·31	3·61	4·57	5·82	218·3
	27	111·76	−1·29	+5·21	−3·19	6·11	238·5
	28	123·95	1·27	6·40	−1·64	6·60	255·6
	29	136·14	1·26	7·10	+0·03	7·10	270·1
	30	148·34	1·24	7·33	1·52	7·48	281·7
	31	160·55	1·22	7·13	2·94	7·71	292·5
June	1	172·77	1·20	6·57	4·18	7·79	302·6
	2	184·99	1·18	5·73	5 20	7·73	312·3
	3	197·21	−1·16	+4·68	+5·96	7·57	322·0
	4	209·45	1·14	3·48	6·45	7·32	331·7
	5	221·68	1·12	2·22	6·65	7·01	341·7
	6	233·92	1·10	+0·93	6·57	6·64	352·0
	7	246·17	1·09	−0·33	6·21	6·22	3·0
	8	258·42	1·07	1·57	5·58	5·79	15·7
	9	270·67	1·05	2·72	4·69	5·42	30·0
	10	282·92	−1·04	−3·77	+3·58	5·20	46·4
	11	295·17	1·02	4·70	2·30	5·23	63·9
	12	307·42	1·00	5·47	+0·88	5·54	80·8
	13	319·66	0·98	6·06	−0·60	6·09	95·6
	14	331·90	0·97	6·43	2·08	6·75	107·9
	15	344·13	0·95	6·52	3·48	7·39	118·1
	16	356·36	0·93	6·30	4·72	7·87	127·0
	17	8·58	−0·91	−5·74	−5·73	8·08	135·1
	18	20·80	0·89	4·82	6·42	8·02	143·3
	19	33·01	0·87	3·56	6·73	7·61	152·2
	20	45·21	0·84	2·03	6·60	6·91	163·0
	21	57·41	0·82	−0·33	6·04	6·05	176·9
	22	69·60	0·79	+1·42	5·07	5·26	195·6

Greenwich Noon.		Selenographical Colong. of the Sun.	Lat. of the Sun.	Geocentric Libration. Long.	Lat.	Amount.	Direction.
		°	°	°	°	°	°
1888. June	23	81·79	0·77	3·06	3·76	4·85	219·1
	24	93·98	−0·74	+4·48	−2·22	5·00	243·6
	25	106 17	0·71	5·56	−0·57	5·59	264·1
	26	118·37	0·68	6·25	+1·07	6·34	279·8
	27	130·57	0·66	6·53	2·61	7·02	291·8
	28	142·77	0·63	6·41	3·96	7·52	301·8
	29	154·98	0·60	5·93	5·07	7·80	310·7
	30	167·20	0·57	5·15	5·92	7·84	319·1
July	1	179·42	−0·55	+4·15	+6·49	7·70	327·5
	2	191·65	0·52	2·98	6·76	7·39	336·3
	3	203·88	0·50	1·73	6·74	6·96	345·7
	4	216·12	0·47	+0·45	6·43	6·44	356·0
	5	228·36	0·45	−0·79	5·84	5·89	7·7
	6	240·60	0·43	1·95	4·99	5·36	21·3
	7	252·85	0·40	2·98	3·91	4·92	37·3
	8	265·10	−0·38	−3·86	+2·63	4·67	55·7
	9	277·36	0·36	4·55	+1·21	4·71	75·1
	10	289·61	0·33	5·03	−0·30	5·04	93·5
	11	301·86	0·31	5·30	1·82	5·60	109·0
	12	314·11	0·29	5·32	3·28	6·24	121·6
	13	326·36	0·27	5·11	4·57	6·85	131·9
	14	338·60	0·24	4·65	5·64	7·30	140·6
	15	350 83	−0·22	−3·96	−6·39	7·51	148·3
	16	2·05	0·19	3·05	6·78	7·43	155·9
	17	15·27	0·16	1·95	6·75	7·03	164·0
	18	27·48	0·13	−0·71	6·31	6·35	173·6
	19	39·69	0·10	+0·59	5·47	5·50	186·1
	20	51·89	0·07	1·88	4·28	4·67	203·7
	21	64·08	−0·04	3·08	2·82	4·17	227·5
	22	76·27	−0·01	+4·11	−1·20	4·28	253·7
	23	88·46	+0·02	4·90	+0·47	4·92	275·4
	24	100·65	0·05	5·39	2·07	5·78	291·0
	25	112·84	0·08	5·57	3·52	6·59	302·3
	26	125·04	0·11	5·42	4·75	7·20	311·3
	27	137·24	0·14	4·96	5·71	7·56	319·1
	28	149·44	0·17	4·23	6·38	7·64	326·6
	29	161·65	+0·20	+3·26	+6·74	7·48	334·3
	30	173·87	0·22	2·12	6·80	7·12	342·8

Greenwich Noon.		Selenographical Colong. of the Sun.	Lat. of the Sun.	Geocentric Libration. Long. of the Earth.	Lat. of the Earth.	Amount.	Direction.
1888.							
July	31	186°09	0°25	+0°88	6°57	6°63	352°4
Aug.	1	198·31	0·27	−0·39	6·06	6·07	3·7
	2	210·54	0·30	1·62	5·29	5·53	17·0
	3	222·78	0·32	2·74	4·27	5·07	32·6
	4	235·02	0·35	3·69	3·04	4·78	50·4
	5	247·26	+0·37	−4·41	+1·65	4·71	69·4
	6	259·51	0·39	4·87	+0·15	4·87	88·2
	7	271·76	0·41	5·04	−1·39	5·22	105·5
	8	284·01	0·44	4·91	2·89	5·69	121·0
	9	296·26	0·46	4·50	4·26	6·19	133·5
	10	308·50	0·48	3·85	5·40	6·62	144·6
	11	320·74	0·51	2·99	6·23	6·91	154·5
	12	332·97	+0·53	−2·00	−6·70	6·99	163·5
	13	345·20	0·55	−0·93	6·75	6·82	172·2
	14	357·42	0·58	+0·17	6·40	6·40	181·5
	15	9·63	0·61	1·23	5·65	5·78	192·2
	16	21·84	0·63	2·21	4·56	5·06	205·8
	17	34·04	0·66	3·08	3·21	4·45	223·9
	18	46·23	0·69	3·82	1·67	4·17	246·4
	19	58·42	+0·72	+4·39	−0·05	4·39	269·3
	20	70·60	0·75	4·78	+1·54	5·02	287·9
	21	82·79	0·77	4·95	3·03	5·80	301·5
	22	94·97	0·80	4·89	4·32	6·52	311·5
	23	107·15	0·82	4·59	5·36	7·06	319·5
	24	119·33	0·85	4·05	6·12	7·33	326·7
	25	131·52	0·87	3·27	6·58	7·34	333·7
	26	143·71	+0·90	+2·28	+6·73	7·10	341·4
	27	155·91	0·92	+1·13	6·58	6·67	350·3
	28	168·11	0·94	−0·13	6·15	6·15	1·2
	29	180·32	0·96	1·42	5·45	5·63	14·6
	30	192·53	0·98	2·68	4·52	5·25	30·6
	31	204·75	1·00	3·81	3·37	5·09	48·4
Sept.	1	216·97	1·02	4·74	2·06	5·16	66·5
	2	229·10	+1·03	−5·38	+0·61	5·42	83·5
	3	241·43	1·05	5·69	−0·90	5·76	99·0
	4	253·66	1·07	5·62	2·40	6·11	113·2
	5	265·90	1·08	5·15	3·81	6·40	126·6
	6	278·14	1·10	4·32	5·03	6·62	139·4
	7	290·37	1·12	3·18	5·95	6·75	152·0

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1888.		°	°	°	°	°	°
Sept.	8	302·60	1·13	1·85	6·51	6·77	164·2
	9	314·83	+1·15	−0·43	−6·65	6·66	176·3
	10	327·06	1·17	+0·96	6·37	6·44	188·5
	11	339·28	1·19	2·22	5·68	6·10	201·3
	12	351·49	1·21	3·29	4·65	5·69	215·2
	13	3·69	1·23	4·12	3·38	5·33	230·6
	14	15·88	1·24	4·73	1·88	5·09	248·3
	15	28·07	1·26	5·11	−0·32	5·12	266·4
	16	40·25	+1·28	+5·29	+1·23	5·43	283·1
	17	52·43	1·30	5·28	2·69	5·92	297·1
	18	64·60	1·32	5·09	3·99	6·49	308·2
	19	76·77	1·33	4·73	5·06	6·92	317·1
	20	88·94	1·35	4·19	5·86	7·20	324·6
	21	101·10	1·37	3·47	6·38	7·25	331·6
	22	113·27	1·38	2·57	6·58	7·07	338·8
	23	125·44	+1·39	+1·50	+6·49	6·67	347·0
	24	137·61	1·40	+0·30	6·12	6·13	357·2
	25	149·79	1·41	−1·00	5·48	5·57	10·3
	26	161·98	1·42	2·34	4·61	5·17	26·9
	27	174·17	1·43	3·64	3·53	5·07	45·8
	28	186·36	1·44	4·83	2·29	5·34	64·6
	29	198·56	1·45	5·81	+0·92	5·88	81·0
	30	210·76	+1·45	−6·48	−0·52	6·50	94·6
Oct.	1	222·97	1·46	6·77	1·99	7·05	106·4
	2	235·18	1·46	6·60	3·39	7·42	117·2
	3	247·40	1·47	5·96	4·64	7·54	128·0
	4	259·62	1·47	4·85	5·64	7·43	139·4
	5	271·84	1·48	3·36	6·30	7·14	152·1
	6	284·06	1·48	−1·60	6·55	6·74	166·3
	7	296·28	+1·49	+0·25	−6·35	6·36	182·3
	8	308·50	1·50	2·03	5·72	6·07	199·5
	9	320·71	1·50	3·60	4·72	5·93	217·2
	10	332·91	1·51	4·85	3·43	5·93	234·6
	11	345·11	1·52	5·75	1·96	6·07	251·2
	12	357·30	1·52	6·29	−0·40	6·31	266·3
	13	9·48	1·53	6·51	+1·14	6·61	279·9
	14	21·65	+1·54	+6·45	+2·58	6·95	291·9
	15	33·82	1·54	6·16	3·87	7·27	302·2
	16	45·98	1·54	5·68	4·94	7·52	311·1

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1888.		°	°	°	°	c	°
Oct.	17	58·14	1·55	5·03	5·75	7·63	318·9
	18	70·30	1·55	4·24	6·28	7·57	326·1
	19	82·45	1·55	3·31	6·51	7·30	333·2
	20	94·60	1·55	2·26	6·45	6·83	340·8
	21	106·75	+1·55	+1·09	+6·10	6·20	349·9
	22	118·90	1·54	−0·18	5·49	5·49	1·9
	23	131·06	1·54	1·52	4·64	4·89	18·1
	24	143·22	1·53	2·89	3·60	4·61	38·8
	25	155·38	1·53	4·23	2·39	4·85	60·5
	26	167·55	1·52	5·46	+1·06	5·56	79·0
	27	179·72	1·51	6·49	−0·34	6·50	93·0
	28	191·90	+1·51	−7·23	−1·76	7·44	103·7
	29	204·08	1·50	7·60	3·13	8·18	112·0
	30	216·27	1·49	7·50	4·38	8·67	120·4
	31	228·46	1·48	6·88	5·42	8·75	128·4
Nov.	1	240·66	1·48	5·75	6·17	8·42	137·2
	2	252·87	1·47	4·15	6·54	7·74	147·7
	3	265·07	1·46	2·21	6·46	6·83	161·2
	4	277·28	+1·45	−0·09	−5·93	5·93	179·1
	5	289·49	1·45	+2·00	4·98	5·37	201·8
	6	301·69	1·44	3·88	3·69	5·35	226·3
	7	313·89	1·43	5·41	2·18	5·83	248·0
	8	326·08	1·43	6·53	−0·56	6·55	265·1
	9	338·26	1·42	7·21	+1·04	7·28	278·2
	10	350·44	1·41	7·48	2·54	7·89	288·8
	11	2·61	+1·40	+7·38	+3·86	8·32	297·7
	12	14·77	1·39	6·98	4·95	8·55	305·5
	13	26·93	1·38	6·34	5·78	8·57	312·5
	14	39·08	1·37	5·50	6·33	8·38	319·2
	15	51·22	1·35	4·52	6·58	7·98	325·7
	16	63·36	1·34	3·41	6·54	7·37	332·6
	17	75·50	1·32	2·22	6·20	6·59	340·4
	18	87·64	+1·31	+0·95	+5·60	5·69	350·4
	19	99·78	1·29	−0·38	4·76	4·78	4·5
	20	111·91	1·27	1·72	3·71	4·09	24·8
	21	124·05	1·25	3·06	2·50	3·95	50·7
	22	136·19	1·23	4·35	+1·18	4·51	74·8
	23	148·34	1·21	5·53	−0·23	5·54	92·4
	24	160·49	1·19	6·54	1·64	6·74	104·1

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1888.	°	°	°	°	°	°
Nov. 25	172·65	+1·17	−7·29	−3·00	7·85	112·5
26	184·81	1·15	7·71	4·25	8·80	119·0
27	196·98	1·13	7·72	5·32	9·36	124·7
28	209·15	1·11	7·25	6·13	9·48	130·4
29	221·33	1·09	6·30	6·60	9·11	136·5
30	233·51	1·07	4·87	6·66	8·25	144·0
Dec. 1	245 70	1·05	3·06	6·33	7·03	154·3
2	257·90	+1·03	−1·01	−5·46	5·55	169·6
3	270·10	1·01	+1·12	4·24	4·39	194·8
4	282·29	0·99	3·12	2·73	4·15	228·8
5	294·48	0·98	4·86	−1·05	4·97	257·8
6	306·67	0·96	6·21	+0·66	6·24	276·1
7	318·85	0·94	7·11	2·28	7·47	287·8
8	331·03	0·92	7·57	3·72	8·43	296·3
9	343·20	+0·90	+7·60	+4·91	9·04	303·0
10	355·36	0·88	7·26	5·81	9·29	308·9
11	7·52	0·85	6·61	6·42	9·20	314·4
12	19·67	0·83	5·71	6·71	8·81	319·7
13	31·81	0·81	4·63	6·71	8·15	325·5
14	43·95	0·78	3·42	6·41	7·25	332·0
15	56·09	0·75	2·13	5·83	6·21	340·0
16	68·22	+0·72	+0·80	+5·01	5·07	350·9
17	80·35	0·70	−0·53	3·97	4·00	7 6
18	92·48	0·67	1·83	2·75	3·30	33·6
19	104·61	0·64	3·07	+1·40	3·37	65·5
20	116·74	0·61	4·21	−0·02	4·21	90·3
21	128·87	0·58	5·23	1·46	5·42	105·7
22	141·01	0·55	6·06	2·85	6·69	115·3
23	153·15	+0·52	−6·66	−4·14	7·84	121·9
24	165·29	0·49	6·99	5·24	8·73	127·0
25	177·44	0·46	6·99	6·09	9·26	131·2
26	189·60	0·43	6·63	6·63	9·36	135·2
27	201·77	0·40	5·88	6·81	8·99	139·4
28	213·94	0·38	4·75	6·58	8·11	144·3
29	226·12	0·35	3·29	5·92	6·77	151·0
30	238·30	+0·33	−1·59	−4·86	5·11	161·9
31	250·49	0·30	+0·22	3·45	3·46	183·7
1889.						
Jan. 1	262·68	+0·28	+2·06	−1·80	2·73	228·7

These ephemerides supply the selenocentric places of the Sun and of the Earth, referred to the system of selenographical co-ordinates. The assumed inclination of the plane of the lunar equator to the ecliptic is = 1°·536. The computations have been made so that the last figures given can be relied on.

The geocentric libration or the selenographical position of the point on the Moon's surface which has the Earth's centre in the zenith is expressed not only by its selenographical longitude and latitude, but only by polar coordinates, of which the zero-point of longitude and latitude or the point corresponding to the centre of the lunar map is the pole. The "direction" of libration is referred to the central meridian of the map in the same way as angles of position are referred to the circle of declination, the zero-direction being that to the north pole of the Moon. The "amount" of libration is the combined effect of the librations in longitude and latitude, or the angular distance of the centre from the point which has the Earth in the zenith. A graphical representation of the libration curves for the nine lunations over which the ephemeris extends may be found in the library of the Royal Astronomical Society. The greatest librations during this period are those of

	Dec. 10	6 h	amount	9°·30	direction 310°·2
and of	Dec. 25	17		9·38	134·0.

The selenographical colongitude (=90°—longitude) and latitude of the point on the Moon's surface which has the Sun's centre in the zenith, or, for briefness, the colongitude and latitude of the Sun serve in the computations of observations of all those phenomena on the Moon's surface which depend on the Sun's light, and they are available for the prediction of the recurrence of such phenomena as have been properly observed and timed. In a paper published in vol. xxxiii. of the *Monthly Notices*, pp. 139–156, a list, comprising 600 lunar spots, may be found, which supplies the data for determining by means of a trifling computation the Sun's colongitude, and consequently, if an ephemeris like the present one is available, the time when the Sun's centre is in the true horizon of any of these spots. When I get the next opportunity, I intend to examine all the lunar sketches in the library of the Royal Astronomical Society, and to prepare a proper list of those which deserve not to be left out and are at least approximately timed, the list being arranged in the order in which the Sun reaches the same altitudes above the horizon of the spots as at the times assigned to the sketches. I content myself at present with giving, as a specimen, a list of the sketches of M. Trouvelot, published in vol. viii. of the *Annals of Harvard College Observatory*, on Plates 4, 15, 18, and 20.

Sun's Colongitude.		Spot.	Time assigned. Camb. M.T.			Mass.	Sun's Lat.	
				h	m			
321°·59 + 0·162	⊙'s Lat.	Guttemberg	1872, July	9	9	0	+0·92	Trouvelot pl. 15
333·61 + 0·075	„	Torricelli	72, Mar. 14	9	30		−1·52	4
340·02 + 0·086	„	Hypatia	72, June 11	10	0		+0·23	15
341·72 − 0·274	„	Plinius	73, Jan. 4	6	0		−1·05	18
345·29 − 0·155	„	Julius Cæsar	72, Mar. 15	9	0		−1·52	15
351·59 − 0·528	„	Linné	73, Mar. 5	7	0		−1·47	20
357·11 − 0·072	„	Agrippa	72, Mar. 16	8	0		−1·52	4
357·15 − 0·047	„	Godin	„	„			„	„
5·47 − 0·870	„	Cassini	72, Oct. 9	8	0		+1·16	18
6·84 + 0·231	„	Alphons	73, Jan. 6	6	30		−1·09	18
6·89 + 0·285	„	Alpetragius	„	„			„	„
6·94 + 0·328	„	Arzachel	„	„			„	„
15·34 − 0·258	„	Eratosthenes	72, April 16	9	0		−1·15	4
15·44 − 1·214	„	Plato	73, Mar. 7	8	0		−1·46	20
15·72 − 1·023	„	Pico	„	„			„	„
18·82 + 0·073	„	Fra Mauro	73, Jan. 7	6	30		−1·12	18
18·91 + 0·165	„	Parry	„	„			„	„
18·93 + 0·182	„	Guerike	„	„			„	„
35·72 + 0·329	„	Agatharchides	72, Sept. 12	10	0		+1·50	15
49·04 + 0·309	„	Gassendi	73, Feb. 8	8	0		−1·53	20
58·87 − 0·433	Lat.	Aristarrh	1873, Jan. 10	5	0		−1·18	Trouvelot pl. 20

In order to ascertain the time when for a spot of the list the Sun is at the same zenith distance as at the time assigned to the sketch, it is only required to multiply the Sun's latitude (taken from the ephemeris for the approximate time of the occurrence) by the factor given in the second column of the list, to add the product to the number in the first column, and to determine by reference to the ephemeris the time when the Sun reaches the colongitude thus found. Though the Sun's zenith distance will then be the same as at the time of the sketch, the effects of the illumination may yet differ sensibly, as they depend also on the Sun's azimuth, and they will therefore only agree if the Sun's latitude is the same on both occasions. Hence the necessity for the column in the list which gives the Sun's latitude at the time of the sketch.

As the daily rate of increase of the Sun's colongitude is 12°·12 to 12°·25, the ephemeris is sufficiently accurate for finding the time to about a minute. But the time thus found is merely that corresponding to the assigned time of the sketch, and any error of the assigned time is simply reproduced. M. Trouvelot's elaborate sketches must have been the work perhaps of hours, and the assigned times may differ considerably from the times

when the shadows in different parts of the sketches have actually been drawn. This may not matter much if the sketches are intended merely to be fair representations. But if the evidence of sketches is to be used in determining the heights of mountains, &c., it is clearly essential that the correct times should be stated when the shadows have actually been drawn. As a striking illustration I may perhaps refer to the latest lunar sketch which has come under my notice, Mr. Elger's interesting sketch of Plato and the region to the south of it, published on Plate x. of vol. vi. of the *Journal* of the Liverpool Astronomical Society.

The sketch represents the shadow of the spire-like pic Plato γ at a time when the point of the shadow has already quitted the crest and is on the inner slope of the opposite wall. Such an occasion affords a very favourable opportunity for procuring most valuable evidence for the determination of the differences of level between the top of the pic γ and the crest of the opposite wall and the floor of Plato. This evidence is secured by watching for and recording the times when the point of the shadow is on the crest of the wall or just quits the crest, and when it gets to the bottom of the slope and enters upon the floor, and by indicating the exact locality. Mr. Elger's sketch clearly indicates the locality, but what information is given about the time? The sketch itself is not even dated, and the time, 6h. on February 1st, 1887, which is found in the text as that when the drawing was made, is probably merely the approximate middle of the whole time expended upon the drawing. However, the time stated will at least allow the prediction of the occurrence of similar opportunities.

The Sun's selenocentric position was 1887, February 1, $6^h\ 0^m$, G.M.T., in colong. 11°·37 and lat. +0°·46. At the assumed place of Plato γ the zenith distance of that time will be reached by the Sun when the colong. is $= 11°{\cdot}92 - 1{\cdot}205 \times$ Sun's lat., and therefore, according to the data of the ephemeris, at the following times:—

1888.	G.M.T. h m	⊙'s Lat. °	1888.	G.M.T. h m	⊙'s Lat. °	1888.	G.M.T. h m	⊙'s Lat. °
April 19	11 19	−1·53	July 16	17 49	−0·17	Oct. 13	1 11	+1·53
May 18	22 47	−1·40	Aug. 15	3 3	+0·61	Nov. 11	15 27	+1·39
June 17	8 41	−0·90	Sept. 13	13 15	+1·24	Dec. 11	8 26	+0·84

But as the Sun's latitudes on all these occasions are different, the localities where the point of the shadow falls will also differ and the times will also be affected, so that there will be interesting variety; and the extension of the observations to other pics Plato δ, ϵ, ζ, Pico, &c., and, in due course, to all other interesting lunar spots, will provide observers with ample opportunities for exercising their patience and skill and for making really *useful* observations.

Comet Sawerthal, 1888. By David Gill, LL.D., F.R.S.

(*Extract from a letter to Mr. Knobel.*)

You have already heard by telegram of the comet discovered by Sawerthal. Early in the morning of February 19 he was returning from the Photographic Observatory (where he is engaged by me on the work of the *Durchmusterung*) when he saw what looked suspiciously like a comet, and he at once verified his suspicion by the aid of an opera-glass. He at once called Mr. Finlay, who had been busy comet-seeking in the early morning for the past fortnight, and a place was determined. Next morning I observed it with the heliometer, and we are now getting a strong series of observations. Approximate elements have been telegraphed home, and you will have the comet to answer for itself in the northern hemisphere about or rather before the time that this reaches you. Perihelion is on March 18.

The reflected light of the comet will now exceed $1\frac{1}{2}$ times that at the time of discovery, and, as perihelion distance is about $\frac{2}{3}$, it seems doubtful if it will become greatly brighter from increased development of tail. It will remain an early morning object during its time of visibility.

Royal Observatory, Cape of Good Hope:
1888, *March* 4.